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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,628	02/06/2002	Shin Kim	9898-206	6784

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EXAMINER

DINH, TUAN T

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/068,628

Applicant(s)

KIM ET AL.

Examiner

Tuan T Dinh

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's election without traverse of Group I (claims 1-14, and 20) in Paper No. 4 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 9, 12-14, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Zambrano (U. S. Patent 5,773,899).

As to claims 1, and 13-14, Zambrano discloses a bonding pad of a semiconductor device or chip as shown in figures 1-7 comprising:

a substructure (2, column 3, line 2) formed on a semiconductor substrate)3, column 3, line 3);

a first dielectric (8; 50-figure 1, column 3, lines 12-14) layer formed on the substructure;

a polysilicon film plate (7, column 3, line 11) formed on the first dielectric layer (8) and configured to improve the resistance of the bonding pad to stress induced during wire bonding (column 3, line 34);

a first metal layer (12, column 3, lines 21-22) formed on the polysilicon film plate (7); and

a second metal layer (16, column 3, line 30) formed on the first metal layer (12).

As to claims 2 and 4, Zambrano discloses a bonding pad of a semiconductor device as shown in figures 1-7 wherein the first and second metal layers are formed having a somewhat horseshoe-shaped cross-section.

As to claim 3, Zambrano discloses a bonding pad of a semiconductor device as shown in figures 1-7 wherein a region of the second metal layer (16) is disposed within a recessed area (14, column 3, line 29) of the first metal layer (12).

As to claim 5, Zambrano discloses a bonding pad of a semiconductor device as shown in figures 1-7 wherein the substructure comprises circuitry configured to provide a dynamic random access memory (column 4, lines 53-54).

As to claim 9, Zambrano discloses a bonding pad of a semiconductor device as shown in figures 1-7 wherein the first and second metal layers (12, 16) are formed of aluminum (column 3, lines 21, and 31-32).

As to claim 12, Zambrano discloses a bonding pad of a semiconductor device as shown in figures 1-3 wherein the wire bonding (17, 18) is beam lead bonding.

As to claim 20, Zambrano discloses a bonding pad of a semiconductor device (chip) as shown in figures 1-7 comprising:

Substructure (2) formed on a semiconductor substrate (3);

first dielectric layer (8) formed on the substructure (2);

polysilicon film plate (7) formed on the first dielectric layer (8) and configured to improve the resistance of the bonding pad to stress created during wire bonding (17, 18);

a first metal layer (12) formed on the polysilicon film plate (7), wherein the first metal layer is formed having a recessed area (14); and

a second metal layer (16) formed on the first metal layer (12) wherein a portion of the second metal layer is arranged within the recessed area of the first metal layer to improve the resistance of the bonding pad to stress (see figure 1).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-8, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zambrano (U. S. Patent 5,773,889) in view of Fukumoto (U. S. Patent 6,307,264).

As to claim 6, Zambrano discloses all of the limitations of the claimed invention, except for the first dielectric layer is a boron phosphor silicate glass (BPSG) layer.

Fukumoto teaches a dielectric layer (4) made of boron phosphor silicate glass disclosed in figures 1-3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use BPSG layer as taught by Fukumoto to employ the bonding

pad structure of Zambrano in order to provide a thermal insulation and an electrical conductivity.

As to claims 7-8, and 10-11, Zambrano discloses all of the limitation of the claimed invention. Zmabrano does not discloses the first dielectric layer has a thickness of between about 3000-4000 Angstroms, the polysilicon film plate has a thickness of about 1000-2000 Angstroms, the first metal layer has a thickness of approximately 7000-7500 Angstroms, and the second metal layer has a thickness of about 8500-9000 Angstroms.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use thickness of each layer structure of the bonding pad for purpose of improve a thermal mechanical stress of the bonding pad , since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F .2d 272, 205 USPQ (CCPA 1980).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Efland et al. discloses related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-305-1341
for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or
proceeding should be directed to the receptionist whose telephone number is 703-308-
0956.

TD
August 12, 2002



K. Kline
Primary Examiner